PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Nobuhiko OGURA

Appln. No.: 09/373,585

Confirmation No.: 2737

Filed: August 13, 1999

Docket No: Q55432

Group Art Unit: 1655

Examiner: F. Lu

For: TEST PIECE, METHOD OF AND APPARATUS FOR MANUFACTURING THE TEST PIECE AND METHOD OF AND SYSTEM FOR READING THE SAME

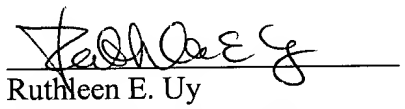
SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

Commissioner for Patents
Washington, D.C. 20231

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. A check for the statutory fee of $320.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,



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APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Commissioner for Patents
Washington, D.C. 20231

Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellant submits the following Brief on Appeal:

I. REAL PARTY IN INTEREST

The real party in interest in this Appeal is Fuji Photo Film Co., Ltd. of Japan. The assignment was recorded on October 28, 1999 at Reel 010344, Frame 0830.

II. RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that would affect the outcome of this appeal.

III. STATUS OF CLAIMS

Claims 6-7 and 14-21 are pending. Claims 6-7 and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Matson et al. (U.S.P. 5,429,807, hereafter "Matson") in view of Yamamoto (U.S.P. 5,145,548, hereafter "Yamamoto") and Heyneker (U.S.P.

6,057,100, hereafter "Heyneker"). Claims 14-20 have been rejected alternatively under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a) as being unpatentable over Stern et al. (U.S.P. 5,631,734, hereafter "Stern").

IV. STATUS OF AMENDMENTS

There are no outstanding Amendments affecting the status of the claims in this appeal.

V. SUMMARY OF THE INVENTION

The present invention relates to a test piece for biological analysis using cDNA samples, an apparatus used to form such a test piece, and an apparatus to read a test piece once biological reactions have occurred on the test piece. Specification page 1, lines 6-11. Conventional test pieces comprise a microarray of cDNA samples spaced very closely together, as shown in Fig. 5. The samples are individually pipetted onto the chip, using a needle-like coating chip for example. Page 2, lines 4-11, 25-26. Since several hundreds of thousands of samples may be required for an analysis, the conventional test piece requires a long time and significant expense to manufacture. Page 3, lines 6-11. When the cDNA samples on the test piece are reacted with a gene sample, respective labeling dyes for each are detected using a photodetector. Page 2, lines 13-18. In view of the close proximity of the samples on the microarray, the accuracy of the two dimensional scan of the photodetector on the microchip array becomes very critical, resulting in a time-consuming and expensive reading process. Applicant's invention overcomes the above deficiencies.

Referring to Fig. 1, the test piece of the present invention includes a flexible substrate 12 bearing known cDNAs 13 which are known binding agents. The cDNAs differ from each other

and are arranged at predetermined intervals on the order of several hundred μm in the longitudinal direction of the substrate. Page 15, lines 23-25 to page 16, lines 1-3. The test piece is cut from a larger substrate 10, as shown in Fig. 2. The larger array 10 is fabricated using the apparatus illustrated in Fig. 3.

Referring to Fig. 3, a conveyor 40 rolls out the substrate 12' in the direction Y, and an applicator 30 having a number of application ports 31 are arranged at predetermined intervals in the direction perpendicular to the direction of travel Y. Page 16, line 25 to page 17, lines 1-4. The applicators form lines of the binding agents along a width of the substrate as the substrate is conveyed. A supply section 20 includes cDNA reservoirs 21 which are respectively connected to the application ports 31. Page 17, lines 5-10. A cutter 61 moves in a direction substantially perpendicular to the direction Y to cut strips comprising the test piece 11. Page 18, lines 5-9.

Fig. 4 illustrates an apparatus for reading a test piece in accordance with a preferred embodiment of the invention. Page 18, lines 17-20. A conveyor 240 conveys the test piece along its longitudinal direction indicated by the arrow X. Page 18, lines 22-23. By providing conveyance along the single axis, the apparatus and scanning of the hybridized samples can be simplified. The binding agent and applied organism are respectively labeled with dyes a and b, and first and second light sources 210 and 220 emit light which respectively excite the dyes a and b. Page 18, lines 24-26 to page 19, lines 1-4. The light passes through an optical system, causes fluorescence in the sample recorded on the substrate which is filtered by device 260, picked up by photodetector 231 and processed by an analysis device 250. Page 19, lines 4-11. The analysis device is further operable to determine a difference between the fluorescence level

between the two dyes. Because the types and sequences of cDNAs on the test piece are known, the analysis means can determine the cDNAs which exist in a first sample and do not exist in the second sample and whose which do not exist in the first sample and exist in the second to provide genetic analysis. Page 19, lines 11-20.

VI. ISSUES

1. Whether the Examiner's rejection of claims 6, 7, and 21 under 35 U.S.C. § 103(a) in view of Matson, Yamamoto and Heyneker is proper.
2. Whether the Examiner's rejection of claims 14-20 under 35 U.S.C. § 102(e) and alternatively 35 U.S.C. § 103(a) in view of Stern is proper.

VII. GROUPING OF CLAIMS

For the Section 103 rejections of claims 6, 7 and 21 in view of Matson, Yamamoto and Heyneker, the claims stand or fall together for purposes of this appeal.

For the alternative Section 102 and Section 103 rejection of claims 14-20, the claims do not stand or fall together for purposes of this appeal.

Accordingly, the claims should be analyzed in the following groups:

Group 1: Claims 6, 7 and 21

Group 2: Claims 14-15

Group 3: Claims 17-18

Group 4: Claim 16

Group 5: Claims 19-20

VIII. ARGUMENTS

As an initial matter, Appellant submits that for the first ground of rejection, the claims stand and fall together for purposes of this appeal. With respect to the second ground of rejection, the claims do not stand or fall together, but rather should be construed in the groups as set forth above in Section VII.

Claim 14 describes a system for reading a test piece comprising different binding agents the system comprising an exciting light source, a conveyor, a photodetector, and an analysis means. Claim 17 describes a system for reading a test piece and the binding agents thereon, the system comprising a light source, a photodetector, and an analysis means. Claims 14 and 17 differ in the inclusion of a conveyor, which is not a necessary requirement for array analysis. Accordingly, independent claims 14 and 17 comprise separately patentable inventions.

Claim 16, although dependent on claim 14 includes a scanning system that is not necessary for the functioning of claim 14. Claim 16 adds an additional feature of linearly scanning a test piece which is not required for the functioning of claim 14, therefore since it could be separately patentable, it is grouped separately. Claims 19-20 involve the scanning mechanism and although dependent on claim 17 includes a scanning system that is not necessary for the functioning of claim 14, therefore since it could be separately patentable, it is grouped separately.

Turning to the cited art, Heyneker describes forming an array of oligonucleotide arrays. Referring to Fig. 1A, a support surface 15 is formed with a set of strips containing

oligonucleotides. The oligonucleotides are spaced in perpendicular stripes 1-10, which may be formed with fibers, such as cut-up strips of the solid support material. Col. 5, lines 15-23.

Matson relates to an apparatus for forming biopolymer arrays on a solid support material. An applicator formed of a thick plate includes several parallel channels formed in a surface of the plate. The applicator is positioned against a solid support material with the surface having channels sealed against a surface of the support material. For each channel, reagents for synthesis are introduced into one end of the channel and collected from the other end. Under the pressure contact, biopolymers such as oligonucleotides are synthesized onto a surface of the support material from reagents introduced into the channels, forming a one-dimensional array of biopolymers with each biopolymer having an identical sequence. No movement is provided to either the thick plate or the support material in forming the one-dimensional array. The strands of nucleotides formed in the one-dimensional array are cleaved and collected in respective channels. As an alternative to cleaving, Matson further teaches that the support material may be placed in sealing contact with the plate to augment the biopolymer strands. In this case, the channels of the applicator are placed at an angle relative to the transferred biopolymers previously formed on the support material. A lift and rotation device, as illustrated in Fig. 6 of Matson, performs this repositioning function. Col. 6, lines 37-42.

Yamamoto relates to lamination and cutting materials for manufacturing ID cards and credit cards comprising laminate of stiff materials and a magnetic strip.

Stern relates to an apparatus for reading information formed on a substrate using three dimensional scanning using a multiple axis scanning system.

The Examiner maintains that the combination of Matson, Yamamoto and Heyneker teach or suggest each feature of claims 6, 7 and 21. Applicant argues that the rejection is not supported for at least six reasons.

Group 1: Argument 1: Yamamoto is not analagous to the claimed invention.

First, Yamamoto is drawn from non-analogous art. A reference may only be applied if a) it is in the same field of endeavor as the application or b) it is reasonably pertinent to the problem with which Applicant is concerned. With respect to element a) Yamamoto relates to the field of manufacturing identification cards whereas the present invention relates to forming a test array of biological substances. These are clearly different fields of endeavor. With respect to element b) Yamamoto relates to laminating sheets of rigid base materials with a magnetic strip and cutting the sheets into individual cards. By contrast, the present invention relates to applying microscopic binding agents on a flexible substrate, and cutting the substrate in a direction that is substantially perpendicular in which binding agents are formed on the substrate. At a minimum the tolerances used in the manufacture of identification cards is less stringent than that used for the present invention. Accordingly, Yamamoto does not meet either the first or second requirements for analogous prior art.

Also, Yamamoto is from a totally different field of endeavor. It would not have been obvious to one skilled in the art of human genomes to a apply a cutting mechanism used for credit cards. Yamamoto teaches a cutting mechanism for cutting out credit cards and various other types of cards, which form a core on a card material. Each core is *punched out* from the card material by the card cutting mechanism. See column 2, lines 54-55. The mere fact that

both cutting devices can make strips is irrelevant since it is obvious to one skilled in an art that different materials require different kinds of cutting mechanisms.

In A.J. Deer Co. v. U.S. Slicing Mach. Co., 21 F. 2d 812, 813 (7th Cir. 1927), the plaintiff owned a patent for slicing meat. At issue was whether the prior art, including art pertaining to a lumber cutting device, invalidated the Plaintiff's meat slicing patent. The court stated that "...we are able to visualize little or no similarity between the processes used in making and producing the lumber and material in a sawmill and those processes used in the meat industry for the slicing of meat...logs are generally of hard dimensions...hard in substance, and are supported and need to be supported ...whereas meat is soft and pliable, with little holding strength."

Here, just as in A.J. Deer Co., a device used for cutting credit cards has little or no similarity to a device used for cutting DNA arrays. It is unimaginable that a cutting device employed for sensitive material such as human DNA could also be used to *punch out* and cut plastic credit cards. The mere fact that Yamamoto provides an example of a cutting device is insufficient since there are various kinds of cutting devices depending on the specialized purpose.

In addition, Yamamoto does not teach or suggest that it can be used for any context other than cutting out credit cards and specifically states that the cutting device be used in manufacturing magnetic cards. See column 2, lines 21-27. As a related matter, it is immaterial whether Yamamoto is a primary reference. In order to be applied in the rejection, Yamamoto must be directed to analagous art.

Group 1: Argument 2: Matson and Yamamoto combined fail to provide a conveyor mechanism for the transfer of agents.

Second, assuming *arguendo* that Matson and Yamamoto may be properly combined, their combination does not teach or suggest each feature of claim 6. Claim 6 describes a conveyor that conveys either the applicator or the substrate relative to each other in a direction which is substantially perpendicular to the direction of the arrangement of applicators. The Examiner cites the positioning means of Matson as teaching the conveyor. However, the positioning means of Matson corresponds to a device that removes a support material off a channel-containing plate and rotates the plate relative to the support material. See Fig. 6 and corresponding text at col. 6, lines 31-41. During this movement, the plate (applicator) and the support are not in contact with each other, and thus no transfer of agents occurs. By contrast, claim 6 describes a conveyor that provides relative movement between the applicator and the substrate while the applicator is applying binding agents.

Group 1: Argument 3: Matson fails to teach a conveying means with corresponding applicators and even if there was a conveying means, the application would result in unsuitable material for analysis.

Third, Applicant argues that Matson may not be modified to include the conveying means as described by claim 6. The Examiner contends that the plate including several parallel channels corresponds to the applicator of claim 6, and further implies that the rotation device of Matson Fig. 6 corresponds to the conveyor. In Matson, if the conveyor provided the relative movement while the applicators applied the lines of binding agents, then this would cause an intermittent pressure seal between the support material and the channels, causing smearing of the biopolymer materials on the support material. This obviously would result in a material that is

unsuitable for any type of analysis because the reagents from different channels would combine together.

Group 1: Argument 4: An intended use is different from an actual feature that is claimed in the invention

Fourth, the claims state the use of a conveyor having a movement "while the applicators apply the plurality of known specific binding agent" and "during application of the binding agents to the substrate." These elements are necessary functions of the claimed system. The Examiner argued this was an intended use of the claimed invention which Matson is capable of performing. The claims involving conveyors are not merely an intended use, but are specifically claimed as part of the structure of the claimed invention.

In re Stencel, 4 U.S.P.Q.2d (Fed. Cir. 1987), where a driver that is adapted to set a joint with a particular threaded lobed collar was at issue, the court held that "[t]his purpose [of using flats with drivers], *set forth in the claims themselves*, 'is more than a mere statement of purpose; and that language is essential to particularly point out the invention defined by the claims." The court also held that Stencel was not inhibited from claiming his driver because "there is no suggestion in the prior art of a driver having the *claimed* structure and purpose." Id. at 1073. The court went on to hold that the references would not have taught or suggested the structure of the driver in the absence of prior knowledge of Stencel's system. Id.

Here, just as in Stencel, the claimed elements of the movement of the conveyor "while the applicators apply the plurality of known specific binding agent" and "during application of the binding agents to the substrate" are more than an intended use, they are specifically stated in the claims as being a structural part of the invention. Also, it cannot be argued that Matson

intended such uses when it does not say so in the reference and the Examiner's argument of obviousness is merely a result of hindsight.

In re Otto, 152 U.S.P.Q. 235 (CCPA 1967) is distinguishable from the claimed invention since Otto involved a *process* for applying curlers to hair. The court found that the process of how hair was being curled was irrelevant, since the claims involved an apparatus for curling hair. Here, we are not discussing a process of using a conveyor, but claim the structure and function of the conveyor itself, including its movements. Therefore the decision in Otto is inapplicable. In re Casey, 152 U.S.P.Q. 235 (CCPA 1967), is distinguishable from the claimed invention because the court found that the invention in Casey described the manner in which the machine was to be utilized rather than describing an apparatus. In addition, the court found that all the structural limitations were met by prior art, whereas here, the Examiner merely stated it was an intended use of the prior art.

Group 1: Argument 5: Matson does not teach a cutting mechanism and a cutting mechanism would be contrary to its purpose.

Fifth, the Examiner contends that it would be obvious to provide test strips such as that illustrated in Heyneker, using the cutting device of Yamamoto and modifying the Matson to include the cutting device. However, in Matson, analysis of a one-dimensional array of biopolymers comprises cleaving of the polynucleotide strands from the support material and collecting the strands in containers at the end of respective channels. Col. 6, lines 15-23. Thus, it would be unnecessary to provide any cutting of the one-dimensional array. In the event that a two-dimensional array is formed, it would not be beneficial to cut the array into strips as test

pieces because each cell contains a different sequence. See Col. 6, lines 57-63 and Fig. 8. Moreover, the nature of the polynucleotides in Matson (formed on a derivatized polypropylene col. 4, lines 60-68) suggests a much more volatile formation than that described in Heyneker (covalent bonding to fibers). Therefore, one skilled in the art would not cut up the formations and substrate in Matson.

Group 1: Argument 6: The Examiner is using hindsight in claiming obviousness.

Sixth, the above arguments suggest that the Examiner is using impermissible hindsight reconstruction in maintaining the rejection. Therefore, Applicant argues that independent claim 6 is patentable for at least the above reasons. Claims 7 and 21 are patentable based on their dependency.

With regard to claims 14 and 15, the Examiner maintains that Stern teaches or suggests each feature of independent claim 14 and dependent claim 15. The Examiner correctly concedes that Stern teaches conveying along multiple axes, and thus does not teach conveying in a single axis. The Examiner presently contends that "this limitation could be considered as inherent to the reference taught by Stern et al., since the scanning system could cause the light to linearly scan the strip-like test piece along multiples axes and the single axis could be considered as one species of multiple axes during the scanning process." Office Action at pages 9-10. The Examiner's rejection of claim 14 and 15 is not supported for at least three reasons.

Group 2: Argument 1: The Examiner lacks a reference to support his argument.

First, the Examiner's rejection is internally inconsistent to the extent that it relies on "inherent disclosure" yet categorizes the scanning in a single dimension as a possible occurrence, i.e., "could be inherent" or "could be considered as one species of multiple axes" scanning. It is well-settled that mere possibilities do not support inherency or prior art rejections. In re Robertson, 49 USPQ2d 1949, 1951 (Fed. Cir. 1999).

Group 2: Argument 2: The burden is on the Examiner to set forth a prima facie case by providing a reference that includes a single axis description.

Second, the Examiner characterizes that a multiple axes scanning (or conveyance) is a more generalized concept than a single axis scanning (or conveyance). Therefore, in order to set forth a prima facie case of obviousness, the Examiner must cite a reference that includes the single axis description. Until the Examiner sets forth a prima facie case, Applicant has no burden to show unexpected results. "Under section 103, teachings of references can be combined *only if* there is some suggestion or incentive to do so. Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious 'modification' of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Fritch, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992)(emphasis supplied). Therefore, the Examiner's suggestion that Applicant provide evidence of unexpected results is premature.

Applicant would also point out that the single axis conveyance provides improved results by greatly simplifying the control, whereas Stern requires a more complex and time-consuming control. The construction and manufacturing of the claimed invention is also greatly simplified over the three-dimensional system of Stern.

Group 2: Argument 3: A single axis scan provides greater control over a three-dimensional scan.

Third, as a related matter, Applicant submits that the single axis scan described by claim 14 provides significant benefits over the three-dimensional scan of Stern. With the three-dimensional scan, the location of the plane may be caused to fluctuate due to changes in distance between a light receiving lens and the subject. By contrast, in a single axis control environment, the relative distance can be maintained in a more stable manner. As a benefit of the more stable structure, the scanning speeds of the single axis control can be made significantly higher than that of Stern. All of the above improvements result from the structure of a single axis of relative movement. Therefore, claim 14 is patentable for at least these reasons. Claims 15 is patentable based on its dependency.

Group 2: Argument 4: In re Kotzab requires Examiner to clearly establish that what he claims is taught in the reference.

Claim 14 describes a single axis of relative movement while the Examiner admits that Stern teaches a multiple axes device. In this connection, the Federal Circuit decision in In re Kotzab, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000) is more applicable. In this recent case, the Federal Circuit reversed the USPTO which rejected a claim reciting a single temperature sensor when it was not clear whether the reference taught a single sensor or multiple sensors. Applicant

submits that the facts of Kotzab are sufficiently analogous to the present situation to warrant withdrawal of the rejection. In the present situation the error of the rejection is more clear than in Kotzab since in the instant case, the reference clearly uses multiple axis and not a single axis.

With regard to independent claim 17 and dependent claim 18, the Examiner contends that page 1 of the previously filed remarks indicated that claim 17 was unpatentable. No such statement is made at page 1, and typographical errors of the Examiner and prior response notwithstanding, claim 17 and dependent claim 18 is clearly patentable over Stern for at least two reasons.

Group 3: Argument 1: The Examiner lacks a reference to support his argument.

First, as discussed above, the Examiner's rejection is internally inconsistent to the extent that it relies on "inherent disclosure" yet categorizes the use of difference values as a possible occurrence, i.e. "could be used to detect interaction." It is well-settled that mere possibilities do not support inherency or prior art rejections. In re Robertson, 49 USPQ2d 1949, 1951 (Fed. Cir. 1999). Until the Examiner sets forth a prima facie case, Applicant has no burden to show unexpected results. Therefore, the Examiner's suggestion that Applicant provide evidence of unexpected results is premature.

In addition, functional language should not be disregarded and should be given patentable weight. A functional limitation is an attempt to define something by what it does, rather than by what it is. There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re

Swineheart, 439 F.2d 210, 169 U.S.P.Q. 226 (CCPA 1971); MPEP 2173.05(g). Therefore, Applicant would like to point out that the use of a difference analysis between the binding agent and samples at different fluorescent values, for example, permits a determination of what organism is present in one sample and absent and another, thereby permitting diagnosis of the source of disease. Thus, this description in the claim involving functional terms, does not make the claim improper.

Group 3: Argument 2: The Examiner has failed to show that Stern provides a sample comparison means.

Second, the Examiner has failed to discuss where the difference analysis is suggested. The Examiner merely describes how Stern includes optical devices that detect different fluorescent wavelengths. There is no further teaching of how samples are compared. In Stern, at no point is there an analysis means to compare scanning results for the comparison of hybridized DNA. Stern merely teaches a method of scanning an organism and provides no analysis mechanism for the comparison of hybridized DNA between organisms. The Examiner cannot argue that the DNA scanning mechanism in Stern can be used to determine DNA hybridization, when there is no evidence in Stern that it does so. Therefore, independent claim 17 is patentable for at least these reasons. Claim 18 is patentable based on its dependency.

Group 4: Argument 1: A single axis scan provides greater control over a three-dimensional scan.

With regard to claim 16, this claim describes scanning in a single direction. The above comments with regard to claim 14 and conveying in a single direction also apply to the scanning feature of claim 16.

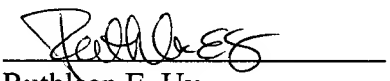
Group 5: Argument 1: A single axis scan provides greater control over a three-dimensional scan.

Claims 19 and 20 further describe the single direction conveyance and scan, respectively, and thus are further patentable for the reasons set forth above for claims 14 and 16.

In view of the foregoing, Appellant respectfully requests withdrawal of the rejections.

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

CLAIMS 6-7 and 14-21 ON APPEAL:

6. An apparatus for manufacturing a test piece for use in biological analysis of a sample organism comprising a strip-like substrate bearing thereon numbers of known specific binding agents which are different from each other and are arranged in a line at predetermined intervals in the longitudinal direction of the strip-like substrate, the apparatus comprising:

a plurality of applicators arranged at predetermined interval in a first direction relative to a sheet-like substrate each of said plurality of applicators respectively operable to apply one of the plurality of known specific binding agents on the sheet-like substrate,

a conveyor which conveys the plurality of applicators or the sheet-like substrate relative to each other in a second direction which is substantially perpendicular to the first direction while the applicators apply the plurality of known specific binding agents, thereby applying the plurality of known specific binding agents in lines which extend in the second direction and are arranged at predetermined intervals in the first direction, and

a cutting means which cuts the sheet-like substrate bearing thereon the plurality of specific binding agents in the first direction into a plurality of strips.

7. An apparatus as defined in Claim 6 in which said specific binding agents are cDNA's.

14. A system for reading a test piece comprising a strip-like substrate bearing thereon numbers of known specific binding agents which are different from each other and are arranged in a line at predetermined intervals in the longitudinal direction of the strip-like substrate, the system comprising:

an exciting light source which projects, onto the test piece applied with substances derived from at least a pair of different sample organisms labelled with different fluorescent dyes, exciting light which excites the fluorescent dyes,

a photodetector which detects fluorescence emitted from the respective fluorescent dyes upon excitation by the exciting light, and

an analysis means which relates the result of detection of the fluorescence with the positions in which the fluorescence is emitted, thereby determining the specific binding agent(s) on the test piece with which the substance derived from each of the sample organisms is hybridized, and determines the difference between the substances derived from the respective sample organisms on the basis of the specific binding agents with which the substances derived from the respective sample organisms are hybridized with each other.

18. A system as defined in Claim 17 in which said specific binding agents are cDNAs and said substance derived from an organism is DNA.

19. A system as defined in Claim 17 further comprising a scanning system which causes the exciting light to linearly scan the strip-like test piece in the longitudinal direction thereof.

20. The system defined in claim 19, wherein the scanning system scans in only the longitudinal direction of the strip-like test piece.

21. The system of claim 6, wherein the binding agents are formed in continuous lines across the sheet-like substrate.

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